STANDARD FORM NO. 64

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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files

DATE: 31 March 1961

FROM : [redacted] 25X1

SUBJECT: Trip Report - Contract RD-161, Task Order 3 [redacted] - Frequency-to-Time-To Frequency Transformation 25X1

1. The F-T-F study is primarily directed toward exploring the possibilities and uses of compressive and dispersive filter networks in RF collection systems. Ideally, the compressive filter would convert the regular frequency spectrum into a form which could be treated as the time domain. While in this time domain, operations such as lock-out and gating could be easily performed by gating generators. After performing the desired operations on the spectrum, the resultant signals could be passed through a dispersing network which would reconstitute them into the frequency domain, with their characteristics essentially unchanged except for those operations which were performed on them while in the time domain. On 29 March 1961 the undersigned visited [redacted] 25X1 to monitor progress on this task. Participating in the discussions were: 25X1

[redacted] 25X1

2. [redacted] has completed a working breadboard model of an F-T-F receiver. In the breadboard system, a 27 mc input signal is being used to simulate a signal transmission. A local oscillator sweeping from 36 - 38 mc produces a 9 - 11 mc swept signal which is fed into the first compressive network. The bandwidth of the entire system is approximately 2 mcs wide, yet sensitivity is equivalent to a bandwidth of about 100 kc indicating a compressive figure of approximately 20. Shaping networks are utilized to eliminate predictable spurious responses. The output from the shaping networks is then fed into the dispersing filter which returns the frequency spectrum to its original state. 25X1

3. Considerable difficulty has been experienced in designing shaping networks to eliminate the effects of distortion and phase

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error from the filters themselves. The results, though substantiating the logical correctness of an F-T-F receiver, are not very encouraging. One of the principal problems concerns the difficulty of acquiring electronic components with sufficiently precise values.

4. This completes the major portion of the study project and it is anticipated that the main effort from now on will be directed toward assembling and evaluating the data and writing a final report.

[redacted] 25X1

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